



**DEPARTMENT OF THE AIR FORCE**  
DETACHMENT 3, AIR FORCE INSTITUTE FOR ENVIRONMENT,  
SAFETY, AND OCCUPATIONAL HEALTH RISK ANALYSIS (AFMC)  
APO AP 96368-5213

15 May 02

MEMORANDUM FOR 354 MDOS/SGOAB  
3349 Central Avenue, Suite 1M07  
Eielson AFB AK 99702-2397

FROM: Det 3, AFIERA/CDR  
Unit 5213  
APO AP 96368-5213

SUBJECT: Consultative Letter (CL), IERA-DO-BR-CL-2002-0039, Non-Destructive Inspection (NDI) Radiation Protection Survey, 354 Maintenance Squadron, Eielson AFB, AK

1. This consultative letter documents a radiation protection survey of the 354 Maintenance Squadron's NDI Flight. Shop records, equipment, and facilities were evaluated to ensure compliance with Air Force Instruction (AFI), Air Force Technical Order (AFTO), and Air Force Occupational Safety and Health Standard (AFOSH STD) requirements. The on-site survey was conducted on 4 Apr 02. As there were no significant changes to NDI equipment, workloads, or facilities affecting radiation protection, only an evaluation of administrative radiation protection measures was accomplished. All aspects of the NDI Flight's radiation protection program were found to be in compliance with Air Force instructions, standards, and technical order requirements.

2. Reference:

- a. AFOSH STD 91-110, *Non-Destructive Inspection and Oil Analysis Program*, 1 Jul 97.
- b. AFTO 33B-1-1, *Non-Destructive Inspection Methods*, 1 Mar 00.
- c. AFI 48-148, *Ionizing Radiation Protection*, 12 Oct 01.
- d. 354 MDG/SGOAB Memorandum, "Periodic Industrial Hygiene Survey, 354 MXS Non Destructive Inspection (NDI), Building 1141, (0686-FAND-172A)," 5 Sep 00.
- e. 354 MDG/SGOAB Memorandum, "Unshielded X-ray Facility Survey, 18<sup>th</sup> FS Phase Dock (Building 1338, Bay 1)," 5 Sep 00.

3. Methods:

a. AFTO 33B-1-1 establishes shielding evaluation and assessment requirements for NDI facilities. This includes a required annual assessment of shielded NDI installations by or under the direction of the local Radiation Safety Officer (RSO) to determine if a more in-depth resurvey is required. A resurvey is required if changes have been made in shielding, operation, workload, equipment ratings, or occupancy of adjacent areas which would adversely affect radiation protection. This survey examines all these parameters to assess the need for resurvey of the facility.

b. AFOSH STD 91-110 establishes radiation protection survey requirements for NDI facilities. This includes resurvey or evaluation (as appropriate) of radiation protection measures at least every 3 years. A resurvey of radiation levels is accomplished if there have been changes affecting the radiation hazard (e.g. equipment ratings, workloads, shielding). Otherwise, only an evaluation of administrative radiation protective measures (e.g. training documentation, instrumentation, dosimetry logs) is required.

3. Scope: Results and recommendations from this evaluation apply to current equipment, workloads, and facilities. Should any of these aspects change which could increase radiation hazard from NDI operations, the NDI flight RSO should contact the installation RSO to arrange a full radiation survey and shielding evaluation in accordance with AFTO 33B-1-1 and AFOSH STD 91-110. **Without any such changes, the NDI flight RSO should assess the radiation protection measures for changes no later than 4 Apr 03. Additionally, the installation RSO should reevaluate the NDI radiation protection program no later than 4 Apr 05.**

4. Personnel Contacted:

<u>Name</u>	<u>Office Symbol</u>
Maj Krystal Murphy	354 MDOS/SGOAB
Capt Amanda Gable	354 MDOS/SGOAB
MSgt Patrick Atwood	354 MXS/LGMFN
TSgt Frank Garcia	354 MDG/SGOD
SSgt Chris Davino	354 MDG/SGSLE
TSgt Warren Wright	168 MXS/LGMFN

5. Results:

a. 354 MXS/LGMFN conducts NDI operations in building 1141. The flight operates a Sperry Lorad LPX-160 x-ray unit to support 354 Wing F-16 and A-10 maintenance. 354 MDOS/SGOAB initially evaluated NDI operations in the building 1141 vault on 31 Jul 97. Operations were reevaluated on 19 Nov 99.

b. Typical inspection workloads are listed in Table 1. Flight workloads, equipment ratings, and facility layout have not changed since the last radiation protection survey.

**Table 1:** 354 MXS/LGMFN Typical NDI Workload

<u>Item</u>	<u>Frequency</u>
A-10 Pave Penny	2 per month
A-10 Nose Landing Gear	2 per month
F-16 Wing Leading Edge	2 per year
F-16 Torque Tubes	2 per year

**Note:** Geometry: 30° angle @ floor towards vault door, SID: 72"

Techniques: 80 kVp/5 mA/2 min or 110 kVp/4 mA/1 min

c. Annual radiation safety training for NDI flight personnel consists of viewing the DoD training video, "Ionizing Radiation Safety," (Joint Visual Information Activity, PIN 613619), and reviewing an ionizing radiation data sheet. Radiation safety training is documented in individual AF Forms 55, in compliance with AFI 48-148, AFTO 33B-1-1, and AFOSH STD 91-110 requirements.

d. An adequate number of calibrated digital alarming dosimeters (DADs) and radiation survey instruments were on hand for NDI operator use. DAD use was properly documented on flight utilization logs.

e. Thermoluminescent Dosimetry (TLD) records were on-hand and up-to-date. The records were properly reviewed for abnormal or overexposures by the installation RSO.

f. NDI operations, including required interlock checks, were properly documented on AFTO Forms 125, *Industrial Radiography Utilization Log*.

6. Conclusions:

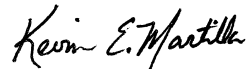
a. NDI operations were in full compliance with all radiation protection requirements in AFI 48-148, AFTO 33B-1-1, and AFOSH STD 91-110. This includes initial radiation surveys, operator radiation safety training, NDI operation documentation, and instrumentation.

b. Additionally, an unshielded NDI radiation safety evaluation was accomplished for Building 1338, Bay 1 on 5 Sep 00. NDI personnel indicated that this location would not be used on a routine basis. The evaluation still

certifies the unshielded location for NDI operations. If used, NDI operators must conduct radiation measurements during operations to ensure compliance with appropriate dose limits.

7. Recommendations: 168 MXS/LGMFN indicated that they do not conduct routine radiological NDI operations. Any such operations should be coordinated with 354 MXS/LGMFN and 354 MDOS/SGOAB to ensure adequate radiation safety measures.

8. If you have any questions regarding this letter, please call me at DSN 315-634-2636, or e-mail me at [kevin.martilla@kadena.af.mil](mailto:kevin.martilla@kadena.af.mil).

A handwritten signature in black ink that reads "Kevin E. Martilla". The signature is written in a cursive, flowing style.

KEVIN E. MARTILLA, Maj, USAF, BSC  
Chief, Radiation Services

cc: 354 MXS/LGMFN  
168 MXS/LGMFN